

Mail Stop Appeal Brief - Patents
Appeal Brief Under 37 C.F.R. § 41.37

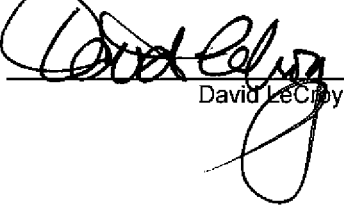
PATENT APPLICATION
Attorney Docket No. 2001.ALC

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: GOODSON, Susanne H. *et al.*
SERIAL NO.: 10/074 522 **GROUP ART UNIT:** 1615
FILED: 14 February 2002 **EXAMINER:** HOWARD, Sharon Lee
ENTITLED: CONTROLLED RELEASE MATERIALS

CERTIFICATE of TRANSMISSION UNDER 37 C.F.R. § 1.8

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office via the USPTO web-based EFS on 26 September 2006.



David LeCroy

Mail Stop Appeal Brief - Patents
Commissioner for Patents
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SUBSTITUTE APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Dear Sir:

In compliance with the requirements of 37 C.F.R. § 41.37(c), Appellants respectfully submit their brief in furtherance of the Notice of Appeal, which was transmitted to the United States Patent and Trademark Office on 10 May 2006.

I. REAL PARTY IN INTEREST

National Starch and Chemical Investment Holding Corporation is the owner of the entire right, title and interest in and to the invention described in this patent application by virtue of an Assignment from the inventor, which Assignment was recorded in the United States Patent and Trademark Office on 14 February 2002 at Reel 012617, Frame 0233.

II. RELATED APPEALS AND INTERFERENCES

With respect to all other prior and/or pending appeals, interferences or judicial proceedings that will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal, there are no such appeals or interferences known to Appellant, Appellant's legal representative or assignee.

III. STATUS OF CLAIMS

Claims 1-10 are pending in this application. Claims 1-10 stand rejected. No claims have been allowed.

The claims on appeal are claims 1-10, which are set forth in the attached Claims Appendix.

IV. STATUS OF AMENDMENTS

All claims stand as amended in Applicant's Reply of 7 September 2005, and as entered in the Examiner's Action of 15 December 2005.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The following summary of the subject matter defined in each of the independent claims involved in the Appeal is offered to enable the Board to more quickly determine where in the application enabling embodiments of the claimed subject matter are described. However, because other embodiments may fall within the scope of the claims, this summary should not be construed as limiting of the claims hereafter discussed.

Claim 1 is the only pending independent claim, with remaining claims 2-10 depending directly from claim 1. For ease of reference, claim 1 is as follows --

1. A solid polymer film comprising a polymer comprising:
 - 2 to 60 mole percent of protonated amine monomer units, wherein said protonation is formed by a fixed acid; and
 - 40 to 98 mole percent of hydrophobic monomer units.

From the above independent claim it is seen that the present invention is generally directed towards polymer films having at least two ingredients – (1) protonated amine monomer units, and (2) hydrophobic monomer units (p. 3, lines 15-18). The composition can form a triggerable protective film layer on a material, releasing that material in a controlled manner at a given set of environmental pH and salt concentrations (p. 2, lines 19-23). From the present invention it has been discovered that such a copolymer, having these constituents in this balanced amounts, is able to form a sharp and controllable triggerable protective layer on materials used in low buffering capacity systems such as detergent systems (p. 2, lines 21-23).

In alkaline water, the surface protonated amine groups on the film become deprotonated by the base present in the alkaline water. This reduces the surface solubility to the point where the polymer film cannot become swollen by the water and thus cannot dissolve. The hydrophobic comonomer aids in preventing swelling of the film. A significant amount of protonated amine groups remain in the interior of the film even in alkaline water. They are protected by the hydrophobic nature of the film and the fact that the surface protonated amine groups have become deprotonated (*i.e.*, the film doesn't swell enough for the base in the water to penetrate the film and neutralize the interior protonated amine groups). Greater ionic strength also aids in not allowing swelling of the film. When the film is then placed in lower pH water, for example neutral water, there is less base present in the water and the film is much easier to swell due to some surface ionization at the lower pH. The water can then penetrate the film. The protonated amines in the interior of the film allow the polymer to then be dissolved in water.

Unneutralized amines with poor water solubility will not show a sharp trigger in systems of low buffering capacity. If these amines are neutralized with a volatile acid, no protonated amine will remain in the film after cure, resulting in films that are insoluble in all pH conditions. Conversely, if a water soluble amine is used, it will not show a trigger, since it will be soluble at every pH.

As previously pointed out, the foregoing summary of the invention has been provided only for purposes of aiding the Board in locating at least an exemplary embodiment of the claimed subject matter within the specification. However, it is also understood that other possible embodiments as may exist within the specification may have been omitted. Compliance with this requirement, therefore, should not be applied to limit the claims.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The grounds of rejection presented for in this Appeal are:

- (a) Claims 1-10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,886,125 to Chromecek ("Chromecek").

VII. APPELLANT'S ARGUMENTS

- A. REJECTION UNDER 35 U.S.C. § 103(a) AS BEING UNPATENTABLE OVER U.S. PATENT NO. 3,886,125 TO CHROMECEK

Claims 1-10 stand rejected as being unpatentable over Chromecek. For the following reasons, Applicants respectfully request reconsideration of the Examiner's final rejection of claims 1-10 under 35 U.S.C. § 103(a).

1. The Standard for Obviousness

As noted in Section 2143 of the Manual of Patent Examining Procedure -

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary

skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Lee*, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002) (discussing the importance of relying on objective evidence and making specific factual findings with respect to the motivation to combine references); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

A statement that modifications of the prior art to meet the claimed invention would have been " 'well within the ordinary skill of the art at the time the claimed invention was made' " because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). See also *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000) (Court reversed obviousness rejection involving technologically simple concept because there was no finding as to the principle or specific understanding within the knowledge of a skilled artisan that would have motivated the skilled artisan to make the claimed invention); *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999) (The level of skill in the art cannot be relied upon to provide the suggestion to combine references.).

2. The Scope and Content of the Prior Art

Chromecek, in its broadest sense, teaches polymer complexes that include a polymer formed at least in part from a monomer having hydrophilic functional groups such as hydroxyl and/or carboxyl and/or amino groups and containing aluminum, zinc or zirconium metal bound in complex form (Abstract). The polymer complexes are suitable for use as carriers, for example, as carriers for medicinal agents, fragrances, insecticides, pesticides, herbicides, etc. (Abstract).

The polymer complexes of Chromecek are formed by reacting the monomers or monomers with a metal salt (preferably aluminum; see, col. 3, lines 14-27) prior to polymerization (col. 1, lines 44-55; col. 3, lines 56-60). According to Chromecek, only one type of functional group (*i.e.*, hydroxy, carboxyl or amino group) is required to be present for formation of the monomer complex (col. 3, lines 9-13). (Only hydroxy and carboxyl functional monomers are exemplified.) These complex monomers are then polymerized by conventional

means, including in the presence of additional non-complex forming monomers (col. 3, lines 60-64). A portion of the complex monomers can be replaced by non-complex monomers (col. 2, lines 55-64).

Once the complex polymer is formed, it can then be split using strong acids or bases (col. 6, lines 46-49 and 55-57) to regenerate the original polymer. As recognized by the Examiner, suitable acids include, for example, hydrochloric acid, sulfuric acid, phosphoric acid, nitric acid **or acetic acid** (col. 6, lines 50-55), which are added after polymerization. Alkalis can be substituted for the acids (col. 6, lines 55-57). The resulting materials thus formed are the original polymer and acid or base salts of the metal (*e.g.* aluminum chloride, zinc hydroxide, zirconium sulfide, etc.). Accordingly, the acid or base is used to remove the metal salts from the polymer, thereby leaving the polymer in an uncomplexed form "without in any way adversely affecting the polymer material", resulting in hydrophilic polymer materials (col. 6, lines 50-60). This is exemplified in Example 15 of Chromecek, wherein 37% hydrochloric acid is added to a polymeric solution formed from the hydroxy functional monomer 2-hydroxyethyl methacrylate and aluminum chlorohydrate, precipitating out poly-(2-hydroxyethyl methacrylate) without any trace of aluminum.

According to the present invention, a fixed acid is an acid that is not removed from the polymer film during formation of the film or upon curing of the film, thereby keeping the amine groups protonated. A fixed acid is different than a volatile acid, such as acetic acid, which will be removed from the film during film formation or curing. When a volatile acid is removed, free amine groups are generated.

Unlike Chromecek, the present invention also does not make use of a complexing metal salt (see, *e.g.*, col. 1, lines 45-55 and col. 3, lines 14-60 of Chromecek). The presence of a complexing metal salt (*e.g.*, aluminum, zinc or zirconium) would precipitate out the amine polymer of the present invention, making it insoluble in all pH ranges. Such a result is clearly undesirable since the present invention seeks a polymer that is insoluble at high pH and soluble at low pH (see, *e.g.*, Abstract). Thus, the presence of a complexing metal salt as taught by Chromecek would be detrimental to the present invention, causing it to fail.

Accordingly, Chromecek does not teach or suggest protonation of its amine functional monomers with a fixed acid. Instead, Chromecek appears to be directed towards chelating a

functional polymer with a metal complex. Therefore, Chromecek is directed towards different polymer chemistry than the polymer chemistry of the present application, resulting in a completely different polymer product (and, more importantly, a completely different and undesired solubility profile).

3. The Claims of the Present Invention are not Anticipated or Obvious

As noted in the 'Summary of the Invention' above, the present invention is directed towards films formed from a copolymer comprising protonated amine monomer units and hydrophobic monomer units. Chromecek suggests that its polymer complexes can be formed from hydrophilic monomers containing hydroxy, carboxyl or amino groups, but only exemplifies hydroxy and carboxyl-containing monomers.

Chromecek teaches that its polymer complexes can be split with dilute strong inorganic or organic acids or alkalis, but does not teach or suggest protonation of its amino monomer units with fixed acids, specifically, fixed acids as defined according to the present application. For example, Chromecek includes acetic acid as an example of its suitable acids, which the present application defines as a volatile acid that is not suited for the present invention (see, p. 5, lines 3-5; see also, Comparative Examples 1-3 of the present application). Chromecek exemplifies the addition of hydrochloric acid to a polymer formed from 2-hydroxyethyl methacrylate (a hydroxy-containing monomer) and aluminum chlorohydrate, resulting in the precipitation of poly-(2-hydroxyethyl methacrylate) (Example 15). In contrast, addition of acid to copolymers according to the present invention result in an aqueous solution, as the copolymer is soluble at lower pH (see, p. 7, line 19; see also, Example 1 of the present application).

Accordingly, Chromecek does not teach copolymers comprising protonated amine monomer units. Instead, Chromecek is directed towards polymer complexes comprising hydrophilic polymers having hydroxyl and/or carboxyl and/or amino groups complexed with aluminum, zinc or zirconium (col. 1, lines 3-8).

For all the foregoing reasons, the Examiner has failed to establish a *prima facie* case of obvious under 35 U.S.C. § 103(a) of any of claims 1-10. Accordingly, the rejection under 35 U.S.C. § 103(a) should be reversed.

VIII. CONCLUSION

For the reasons mentioned above, Appellant's polymer film composition is not made obvious in view of Chromecek as Chromecek does not teach protonated amine monomer units, wherein the protonated amine monomer units are formed by fixed acids.

For all of the foregoing reasons, it is respectfully submitted that the final rejection of all claims is untenable and should not be sustained. Allowance of the claims is believed to be in order, and such allowance is respectfully requested.

Respectfully submitted,

Dated:

26 September 2006

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CLAIMS APPENDIX

Claims of U.S. Application No. 10/074 522 on Appeal

1. A solid polymer film comprising a polymer comprising:
2 to 60 mole percent of protonated amine monomer units, wherein said protonation is formed by a fixed acid; and
40 to 98 mole percent of hydrophobic monomer units.
2. The polymer film of claim 1 wherein said hydrophobe monomer units comprise non-protonated amine monomer units.
3. The polymer film of claim 1 comprising 5 to 40 mole percent of said protonated amine monomer units.
4. The polymer film of claim 1 comprising from 5 to 100 mole percent of at least one amine monomer, including both protonated and non-protonated amines.
5. The polymer film of claim 4 comprising from 10 to 40 mole percent of at least one amine monomer, including both protonated and non-protonated amines.
6. The polymer film of claim 5 comprising from 10 to 20 mole percent of at least one amine monomer, including both protonated and non-protonated amines.
7. The polymer film of claim 1 wherein said fixed acid comprises at least one monofunctional acid.
8. The polymer film of claim 1 wherein said hydrophobic monomer comprises (meth)acrylates, maleates, (meth)acrylamides, vinyl esters, itaconates, styrenics, unsaturated hydrocarbons and acrylonitrile, nitrogen functional monomers, vinyl esters, alcohol functional monomers, unsaturated hydrocarbons, and C₈-C₂₂ alkoxylated (meth)acrylates.

9. The polymer film of claim 8 wherein said hydrophobic monomers comprise methyl methacrylate, ethyl acrylate, and butyl acrylate.
10. The polymer film of claim 1 comprising from 60 to 98 mole percent of said hydrophobic monomer units.

EVIDENCE APPENDIX

No evidence has been submitted pursuant to 37 C.F.R. §§ 1.130, 1.131 or 1.132, nor is there any other evidence entered by the Examiner and relied upon by appellant in this appeal. Therefore, no copies of such evidence are to be had for the purpose of this Appendix.

RELATED PROCEEDINGS APPENDIX

As noted in Section II of the current Appeal Brief, no decisions have been rendered by a court or the Board in any proceeding related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal. Therefore, no copies of such decisions are to be had for the purpose of this Appendix.